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ABSTRACT

This paper describes a theoretical model of the multidimensional relationship between professional development activities for educators and improvements in student learning. It also examines the validity and appropriateness of the model through five in-depth case studies of school-based professional development programs. The model presented extends the work of current researchers and is more comprehensive than other recent models. The premise of the model is that the quality of professional development is influenced by many factors, with the most important being grouped into three categories: content characteristics, process variables, and context characteristics. Quality of professional development, the central component of the model, is linked to teachers' knowledge and practices, administrators' knowledge and practices, and parents' knowledge and practices. Student learning outcomes result from these interactions. The case studies used to test the model came from the National Staff Development Councils Model School Program. Three implications are drawn from the model. First, the model shows that the relationship between professional development and improvements in student learning is complex but not chaotic or random. Second, the model offers guidance to those interested in determining what makes professional development effective. Third, the model illustrates the importance of a systemic approach to professional development and the need to view professional development reform from a systems perspective. (Contains 1 figure and 23 references.) (SLD)

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Linking Professional Development to Improvements in Student Learning

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For many years educators have operated under the premise that professional development is good by definition and, therefore, more is always better. The current emphasis on accountability, however, has led to new demands for evidence on the effectiveness of professional development programs and activities. In particular, policy makers and educational leaders want specific evidence of the impact of professional development activities on well-defined student learning outcomes. While those responsible for professional development have generally assumed a strong and direct relationship between professional development for educators and improvements in student learning, few have been able to describe the precise nature of that relationship.

This paper describes a theoretical model of the multi-dimensional relationship between professional development activities for educators and improvements in student learning. It also examines the validity and appropriateness of the model through five, in-depth case studies of school-based professional development programs. The model presented extends the work of current researchers (Cohen & Hill, 1998, 2000; Kennedy, 1998) and is more comprehensive than other models (e.g., Wang, Frechtling, & Sanders, 1999). It is designed to bring added clarity to discussions of the complexities of this relationship. Furthermore, it is hope this model will challenge professional development researchers to explore this relationship more thoroughly in order to improve our understanding of its nature.

The Model

The proposed theoretical model of the relationship between professional development activities and improvements in student learning is illustrated in Figure 1. The premise of the model is that the quality of professional development, or what Cohen and Hill (2000) refer to as "teachers' opportunities to learn," is influenced by a multitude of factors. Those believed have the most immediate and direct influence, however, can be classified in three major categories: content characteristics, process variables, and context characteristics.

Content Characteristics refer to the "what" of professional development. They concern the new knowledge, skills, and understandings that are the foundation of any professional development effort. Content may include a deeper understanding of specific academic disciplines, how students learn and acquire understanding of those disciplines, and particular pedagogic processes (Shulman, 1986). Professional development activities help educators keep abreast of this emerging knowledge base so that they can continually refine their conceptual and craft skills (Guskey & Huberman, 1995). It also may involve aspects relating to the magnitude, scope, credibility, and practicality of the change required to implement this new knowledge (Fullan, 1993).

Process Variables refer to the "how" of professional development and concern not only the type and forms of professional development activities (Loucks-Horsley, Hewson, Love, & Stiles, 1998; Sparks & Hirsh, 1997), but also the way those activities are planned, organized, carried out, and followed-up. Most of the writing about professional development quality and

most professional development research focuses on these variables. Garet, Porter, Desimone, Birman, and Yoon (2002), for example, describe these as professional development's "core features," and stress the importance of "active learning" and "fostering coherence" among various opportunities for teacher learning and development. Other examples include the use of alternative forms of professional development such as coaching, action research, and focused study groups (Joyce & Showers, 1995; Louis & Miles, 1990).

Context Characteristics refer to the "who," "when," "where," and "why" of professional development. They include the traits of the particular group of educators involved in the professional development activities, the environment in which they work, and the students they serve. Context also involves the organization, system, or culture in which professional development takes place and where the new understandings are to be implemented (Huberman & Miles, 1984). Furthermore, context includes the district or school level policies that may impact implementation. An important part of the context, for example, may be the pressure created by a statewide assessment and accountability program or a school district's high expectations for the learning of all students.

ADMINISTRATORS' Knowledge & Practices
POLICIES on Curriculum, Organization, Textbooks, Discipline, Attendance, Grading, etc.
Supervision Professional Support, Coaching & Evaluation
CONTENT Characteristics
PROCESS Variables
CONTEXT Characteristics
QUALITY of Professional Development
TEACHERS' Knowledge & Practices
IMPROVED STUDENT LEARNING OUTCOMES
Parent Conferences, Corrected Assignments, Guided Homework
PARENT Education
PARENTS' Knowledge & Practices

Figure 1. Model of the relationship between professional development and improvements in student learning.

Content characteristics, process variables, and context characteristics are all important in determining the *Quality of Professional Development*, the central component of the model. But professional development programs and activities do not directly or exclusively affect improvements in student learning (see Wang, Frechtling, & Sanders, 1999). Rather, their influence on students is accomplished principally through their positive affect on the knowledge and practices of teachers and school administrators.

Teachers' Knowledge and Practices are the most immediate and most significant outcomes of any professional development activity. They also are the primary factor influencing the relationship between professional development and improvements in student learning. Clearly if professional development does not alter teachers' professional knowledge or their classroom practices, little improvement in student learning can be expected.

Administrators' Knowledge and Practices are also directly influenced by the quality of professional development activities, although often neglected in program evaluations (Guskey, 2000). While administrators typically do not influence student learning directly, their knowledge and practices indirectly influence students in two important ways. The first is in their interactions with teachers, particularly through supervision activities, professional support, coaching and evaluation procedures. The second way administrators indirectly influence student learning is through their leadership in forming school policies and in establishing elements of the school's community and culture. Teachers' knowledge and practices are influenced by school policies and also affect school policies, especially through lead-teacher programs, shared governance, and school-based decision making (see Guskey & Peterson, 1996). Although this influence is direct, its strength depends largely on the degree to which the process for teacher input in policy formulation is routine and formalized (Deal & Peterson, 1994).

Parents' Knowledge and Practices are included in the model as the third primary influence on improvements in student learning. Parents have a direct and powerful effect on student learning, not only through the learning experiences they provide for their children during early years of development, but also by their continuing involvement in school activities and homework assignments (Cooper, 1994; Grolnick & Slowiaczek, 1994). *Parent Education* programs can provide valuable information and strategies to parents who want to help their children succeed in school (Hoover-Dempsey & Sandler, 1995).

Student Learning Outcomes are broadly defined in the model to include the entire range of student learning goals. Most often they include indicators of student achievement, such as assessment results, portfolio evaluations, marks or grades, or scores from standardized examinations. However, they might also include measures of students' attitudes, study habits, school attendance, homework completion rates, or classroom behaviors. School-wide indicators such as enrollment in advanced classes, memberships in honor societies, attendance rates, dropout statistics, and participation in school-related activities might be considered as well.

It is recognized, of course, that some important relationships are not noted in the model. Federal and state legislation, state departments of education, and local school boards, for instance, have significant influence on policies that affect student learning. Graduation requirements, school calendars, and assessment and accountability programs are but a few examples. The relationships identified in the model, however, are those believed to be the most direct and most

powerful. Furthermore, with the exception of certain context characteristics, these factors are also the most directly influenced by educators and, hence, the most immediately alterable.

Evidence Supporting the Model

To test the model we analyzed reports gathered through the National Staff Development Council's Model School Program (Killion, 1999). These reports consist of in-depth case studies of school-based professional development programs and activities. The reports are highly detailed and include rich descriptions of the professional development activities within each site over a minimum of three years. Three programs considered "promising" and two considered "insufficient" were randomly selected for analysis. The "promising" programs provided evidence drawn from multiple sources of sustained improvements in students' performance. The "insufficient" programs did not. In other words, although individuals involved in the "insufficient" programs rated highly their professional development experiences and believed they were of excellent quality, no evidence was provided to show that these activities resulted in any change in instructional practices or school procedures, or that they yielded demonstrable improvements in student learning outcomes.

Both authors read the reports independently, analyzing the content in terms of the elements included in the proposed model. Special note also was made of any factors that might have contributed to the results but were not readily classified within a specific model element. These factors were then discussed until consensus was reached about appropriate classification. Relationships between model elements were also considered in the analysis, paying special attention the reported or implied direction of the relationship.

Our analyses generally confirmed the presence and strong influence of the school-based factors in the model and their relationships. The descriptions of each of the "promising" programs included detailed information about the specific changes in teachers' and administrators' knowledge base, skill level, instructional practices, or school procedures that were believed to have yielded the identified improvements in students' performance. Data regarding the implementation of new practices varied from study to study. In two cases it consisted primarily of self-reports while the other included evidence from direct observations. Still, model elements and their relationships were supported. Only one of the three program descriptions included information on parent involvement, however, and this evidence was inadequate for judging the validity of this component of the model.

Analyses of the "insufficient" programs offered further supporting evidence. In one case there appeared to be a lack of administrator participation and support. The teachers were involved in professional development activities away from their school and without the involvement of building administrators. There were no follow-up activities on site and no effort was made to ensure appropriate and sustained implementation of recommended practices. Hence, while administrative support may not be a requirement for improved practices, the lack of support appears to diminish the likelihood of implementation and continuation.

In the second case a lack of policy consistency seemed to be the most probable factor contributing to the lack of successful implementation and subsequent results in terms of student learning outcomes. The professional development activities emphasized character education and student responsibility, and were regarded very favorably by participating teachers. However, no

effort was made to offer teachers feedback on the effects of the program and no systematic evidence was gathered regarding relevant student learning outcomes such as students' involvement in civic activities, their interactions with each other, or incidents of behavioral infractions.

Implications and Conclusions

The proposed model yields three important implications. First, it shows that while the relationship between professional development and improvements in student learning is complex and multifaceted, it is not random or chaotic. By identifying the major contributing factors in this relationship and offering at least tentative evidence of the direction of interrelatedness among these factors, the model brings a sense of order to efforts to improve the effectiveness of professional development. Obviously the strength of these factors and how they interact will vary from setting to setting. Nevertheless, the model helps make sense of that influence and helps better our understanding of the contribution of these factors to the relationship.

Second, the model offers guidance to those interested in determining what makes professional development effective and in evaluating the effectiveness of professional development programs and activities. Undoubtedly, most educators today would like to be able to measure the impact of professional development in terms of demonstrable improvements in student learning. Recognizing the various factors that influence this relationship, however, will help evaluators not only document results but also offer explanations as to why those results occurred.

Third, the model illustrates the importance of a systemic approach to professional development and the need to view professional development reform from a systems perspective (Sparks, 1996). Professional development efforts that do not take into consideration the complex nature of the relationship between professional development and improvement in student learning, or the various factors that impinge on that relationship, are unlikely to succeed. Improvements may be evidenced in some classrooms or in some schools, but it seldom brings improved success at high levels of learning for all students.

Although we believe this model of the relationship between professional development activities for educators and improvements in student learning is a useful tool, we also recognize that any model of such a highly complex process is, in many ways, an over-simplification. Not noted in the model, for example, is the reciprocal influence that exists between administrators and teachers, between teachers and parents, and between students and teachers. The model also does not make clear the effects of improved student learning on teachers' subsequent practices or on the nature of succeeding professional development endeavors (Guskey, 1991).

Furthermore, the model does not adequately portray the important influence the desired student learning outcomes should have on the content, process, and context of professional development programs and activities. Clearly, student learning outcomes should provide the starting point for *all* educational improvement efforts and professional development activities (Guskey, 2002).

Still, the model does identify critical factors in the relationship between professional development and improvements in student learning. It also makes clear that these factors can be documented and assessed. Identifying these factors and providing some indication of their influence we hope will lead to higher quality professional development programs and offer

guidance to researchers investigating various aspects of this crucial relationship in the educational improvement processes. Teachers, administrators, and parents all have critical roles to play in the improvement of student learning, and their ability to fulfill their responsibilities more effectively will be determined largely by the quality of professional development. We believe this model clarifies those relationships in a way that can assist school leaders both in planning and in assessing professional development endeavors.

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